

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**LISTING OF CLAIMS:**

1. (Original) A process for the preparation of a micron-scale film of  $\text{YBa}_2\text{Cu}_3\text{O}_{7-y}$  ( $y \leq 0.08$ ) on a substrate, which consists in spraying an aqueous solution of precursors of the chemical elements to be deposited, in order to form an aerosol, in transporting the aerosol using a carrier gas from its source to a reaction region, where it comes into contact with the surface of a heated substrate, on which surface it undergoes pyrolysis, followed by an annealing operation, characterized in that:

a) the precursor solution is a solution of yttrium nitrate, barium nitrate and copper nitrate, in which the total nitrate concentration is substantially equal to the saturation concentration, and the relative concentrations of the various precursors in the solution are such that  $0.11 \leq F_Y \leq 0.28$ ,  $0.46 \leq F_{Ba} \leq 0.58$ ,  $0.2 \leq F_{Cu} \leq 0.37$ ,  $F_Y$ ,  $F_{Ba}$  and  $F_{Cu}$  being the respective atomic fractions of the cations;

b) the precursor solution is sprayed for a time ranging from 1 minute to 5 minutes;

c) the carrier gas is an inert gas, the flow rate of which is such that it generates a laminar flow in the environment of the forming film;

d) the pyrolysis is carried out on the heated substrate at the temperature between  $800^\circ\text{C}$  and  $870^\circ\text{C}$ ; and

e) the annealing is carried out in oxygen, at a temperature between  $850^\circ\text{C}$  and  $880^\circ\text{C}$  and at least  $10^\circ\text{C}$  higher than the pyrolysis temperature during a first step for a time of 1 to 2 hours, then at a temperature between  $450^\circ\text{C}$  and  $550^\circ\text{C}$  during a second step for a time of 0.5 to 1.5 hours.

2. (Original) The process as claimed in claim 1, characterized in that the copper precursor is  $\text{Cu}(\text{NO}_3)_2 \cdot n\text{H}_2\text{O}$ ,  $n \geq 2.5$ .

3. (Original) The process as claimed in claim 1, characterized in that the yttrium precursor is yttrium nitrate  $\text{Y}(\text{NO}_3)_3 \cdot m\text{H}_2\text{O}$ ,  $m \geq 4$ .

4. (Original) The process as claimed in claim 1, characterized in that barium precursor is  $\text{Ba}(\text{NO}_3)_2$ .

5. (Original) The process as claimed in claim 1, characterized in that the respective proportions of the various nitrates in the precursor solution are such that  $\text{FY} = 0.2$ ,  $\text{Ba} = 0.56$  and  $\text{Cu} = 0.27$ .

6. (Original) The process as claimed in claim 1, characterized in that the substrate on which the  $\text{YBa}_2\text{Cu}_3\text{O}_{7-y}$  film is deposited is chosen from  $\text{MgO}$ ,  $\text{LAO}$  ( $\text{LaAlO}_3$ ),  $\text{STO}$  ( $\text{SrTiO}_3$ ), a nontextured Ag metal substrate and a biaxially textured Ag substrate, or an yttria-stabilized  $\text{ZrO}_2$  (YSZ) substrate or a nickel substrate.

7. (Original) The process as claimed in claim 1, characterized in that the carrier gas used for transporting the aerosol may be chosen from argon and nitrogen.

8. (Original) The process as claimed in claim 1, characterized in that the spraying in step b) is carried out for a time of greater than 3 minutes.

9. (Currently Amended) A substrate coated with a micron-scale film of  $\text{YBa}_2\text{Cu}_3\text{O}_{7-y}$  ( $y \leq 0.08$ ), obtained by a process as claimed in ~~one of claims 1 to 8~~ claim 1.

10. (New) A substrate coated with a micron-scale film of  $\text{YBa}_2\text{Cu}_3\text{O}_{7-y}$  ( $y \leq 0.08$ ), obtained by a process as claimed in claim 2.

11. (New) A substrate coated with a micron-scale film of  $\text{YBa}_2\text{Cu}_3\text{O}_{7-y}$  ( $y \leq 0.08$ ), obtained by a process as claimed in claim 3.

12. (New) A substrate coated with a micron-scale film of  $\text{YBa}_2\text{Cu}_3\text{O}_{7-y}$  ( $y \leq 0.08$ ), obtained by a process as claimed in claim 4.

13. (New) A substrate coated with a micron-scale film of  $\text{YBa}_2\text{Cu}_3\text{O}_{7-y}$  ( $y \leq 0.08$ ), obtained by a process as claimed in claim 5.

14. (New) A substrate coated with a micron-scale film of  $\text{YBa}_2\text{Cu}_3\text{O}_{7-y}$  ( $y \leq 0.08$ ), obtained by a process as claimed in claim 6.

15. (New) A substrate coated with a micron-scale film of  $\text{YBa}_2\text{Cu}_3\text{O}_{7-y}$  ( $y \leq 0.08$ ), obtained by a process as claimed in claim 7.

16. (New) A substrate coated with a micron-scale film of  $\text{YBa}_2\text{Cu}_3\text{O}_{7-y}$  ( $y \leq 0.08$ ), obtained by a process as claimed in claim 8.